STATEMENT BY BRIGADIER GENERAL L. J. McNAIR

SUBJECT: Armament of artillery, etc.

1. I have been on general staff duty in France since June 26, 1917. My actual experience on the front has been extremely limited. I have however been an eye witness of the following important operations:

French attack at Verdun of August 20, 1917.
British attack around Ypres, October 1, 1917.
American attack at St. Mihiel, September 12, 1918.
American attack of Meuse-Argonne of Sept. 27 and November 1, 1918.

My opinions are thus based on experience which while broader than that of many, is lacking in that intimate knowledge of front-line conditions which can only be gained by actual service with fighting troops. On none of the subjects herein discussed have I had occasion to make an exhaustive study. What follows is merely a statement of offhand opinion.

2. To my mind the outstanding developments of the war, from an artillery standpoint, include the following:

That the infantry is as ever the dominant fighting arm.
The maintenance of the supremacy of the light field gun as the dominant artillery weapon.
Aerial observation.
Map-firing.
Motor transport.
Increased importance of machine guns.

I emphatically disagree with the opinion that this has been an artillery war. Artillery played perhaps a dominant role in 1915, 1916, and during other similar periods, but this was not war; there was practically no progress and no decision.

3. I have been much impressed with the extent to which European armaments before the war, and naturally during its progress, were based on conditions peculiar to them. Too often in the past we have adopted materiel and also organizations simply or largely because they were used in Europe. It has also been instructive to note how erroneous were pre-war conceptions of war conditions, and this by no means corrected itself when war began, but continued throughout until perhaps the summer of 1918. This points to the necessity of not basing armament and organization on too rigid a conception of possibilities, but rather to making them

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suitable for a wide range of conditions. It is believed incorrect to assume that a long stabilized front will never recur, but it would also be incorrect to build only for a warfare of huge concentrated masses such as have been used on the Western front.

4. Division artillery. This should be based on its primary function of supporting the infantry. Up to a certain point, which varies with the nature of the operations, the stronger the artillery support the faster and more easily the infantry will progress, and the smaller will be its losses. Beyond a certain point, there is no greater support afforded the infantry and additional artillery becomes an incumbrance to the division. There is no gain in the support afforded when the quantity of artillery becomes greater than can be supplied with ammunition, or when its fire more than covers the hostile resistance and actually restricts the infantry in its movements. This occurred more or less generally in the St. Mihiel operations. Artillery becomes an incumbrance when it monopolizes more personnel, with their rations and other supplies, than is commensurate with the support rendered, when it is not sufficiently mobile to keep up with the infantry, and when its ammunition supply congests the roads and does not render commensurate support so that the progress of the division as a whole is stopped for lack of vitally necessary supplies. A small amount of artillery efficiently handled will accomplish a given result much more easily than a large amount less efficiently handled.

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5. If the necessary total quantity of suitable kinds of artillery is on hand for the whole fighting force, it is possible to assign it to divisions to meet the situation, but this is an inferior method to having a division with a permanent quota of artillery. Distinctly better results are obtained with artillery which is an integral part of the division and with which it has learned to function smoothly. Opinion has been expressed against division artilleries as such. The system now in use should however by all means be retained.

Admitting the necessity of division artilleries, it may be advanced that they should be made large enough to cover all possible needs, and drop portions which are in excess of the necessities of a particular situation. This would result in a waste of artillery in the form of remnants scattered about and not organized for effective employment collectively; or in division commanders attempting to use a greater quantity of artillery than is possible with best efficiency. This latter tendency was seen in the St. Mihiel operations, when division commanders attempted to advance two division artilleries per division when the resistance was very slight and when it was with the greatest difficulty that one was moved.

The proper quota of division artillery must be a compromise between the two extremes above discussed, and should be sufficient

for the needs of the infantry in normal combat, as opposed, for example, to the heavy initial concentration necessary for the attack of a stabilized position.

6. There is no exact solution of this question, and it will doubtless always be a subject of discussion. One regiment of light artillery is believed decidedly insufficient, assuming substantially the same infantry strength as at present. Two regiments give an organization conveniently subdivisible with respect to the infantry and is not believed excessive.

The present quota of 155 howitzers is if anything too great and too heavy. The necessity for a howitzer in the division is clear, as there are numerous missions in infantry support for which the 75 lacks power and has too flat a trajectory. That the 155 howitzer is a most effective weapon is everywhere admitted. It is very effective against machine defenses, and for bombardment of villages or field fortifications, and for counter battery work. But, when it is considered that a day's firing with this weapon requires about four times (Par.7) as much transport as for a 75, as much as a regiment of 155 howitzers must be carefully considered.

I have recently favored mixing a limited number of howitzers in the light regiments, but after further study and conversations with other officers including infantrymen, I believe the two light regiments should be kept intact, and an additional unit added as at present. But this unit should be lightened, so as to relieve the problem of ammunition supply and make the division more mobile.

7. The question of how many and what types of howitzers should be given to the division is largely one of ammunition supply. It is possible to arrive at rough figures in this matter.

Taking a day of fire for the various weapons as laid down in Bulletin 91, A.E.F., Nov. 12, 1918, we have the following:

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Caliber	Day of Fire
75	300
3.8 (100)	220
4.7 (120)	180
6.1 (155)	150

If the weight of the 75 ammunition is taken at 1, the relative weights of the various calibers are expressed by:

75	1
3.8	2
4.7	4
155	8

The relative weights of a day of fire for the various calibers, which is a fair measure of the ammunition problem, will then be found to be represented by the following figures:

75	10
3.8	15
4.7	24
155	402

With these figures, the problem of ammunition supply can be evaluated for the various possible quotas of division artillery. The figures just given are used as the amount of ammunition transport required.

Present quota

12 Btries 75 -	120
6 Btries 75 - 155	240
Total	360

(a)

12 Btries 75 -	120
4 Btries 3.8 -	60
2 Btries 155 -	80
	260

(b)

12 Btries 75 -	120
3 Btries 3.8 -	45
3 Btries 155 -	120
	285

(c)

12 Btries 75 -	120
6 Btries 3.8 -	90
	210

(d)

12 Btries 75 -	120
4 Btries 4.7 -	96
2 Btries 155 -	80
	296

(e)

12 Btries 75 -	120
6 Btries 4.7 -	72
3 Btries 155 -	120
	312

(f)

12 Btries 75 -	120
6 Btries 4.7 -	144
	264

(g)

12 Btries 75 -	120
3 Btries 155 -	120
	240

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8. Perhaps the most striking geature of the foregoing figures is the fact the ammunition supply of one regiment of 155's is twice as great as for two regiments of 75's. It is not believed that they render a commensurate return, and herein lies the explanation for the continued predominance of the 75.

The substitution of medium (d) or light (a) howitzers for two thirds of the 155 howitzers reduces the ammunition supply by 18% and 28% respectively, which hardly justifies the introduction of an additional caliber.

It is felt that the best combination is (g), which reduces the ammunition supply 33%, and still leaves a powerful howitzer quota, and one which with the addition of reinforcement in special cases will give amply heavy artillery.

The division artillery recommended is then:

2 regiments of 75's
1 battalion of 155 howitzers, of 3 batteries.

A practical consideration against the introduction of medium or light howitzers is the fact that none are on hand, and it is questionable whether appropriations for them could be obtained.

9. Corps artillery. The functions of such artillery are believed to be primarily counter battery work and long range fire for harrassing, interdiction, and similar purposes.

The 4.7 gun should be eliminated as not sufficiently powerful. The corps artillery types should be a gun and a howitzer of 10 or 12 tons on the road, transported as a single load. The gun should be for range; the howitzer for destructive effect, with the maximum range practicable.

In addition, the 155 howitzer should be introduced, for use as a corps weapon, and also to provide reinforcements for division artilleries in special situations.

The corps artillery quota should then be a brigade as follows:

1 regiment of 155 Filloux, or similar type
1 regiment of 8" howitzers, or similar type
1 regiment of 155 howitzers.

10 Army Artillery. The types should be guns and howitzers, a nucleus to be constructed and organized. They should be of the maximum power that can be developed for transport in two loads of 10 to 12 tons each. I am opposed to relying on railroad artillery for weapons of this power.

In addition there should be a reserve of corps artillery weapons for use as army artillery and for reinforcing the corps artillery in special situations.

I am not prepared to state the amount of army artillery which should be projected.

The 75 regiment should be eliminated from the army artillery, as a sufficient reserve of these weapons is available from divisions out of line.

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11. Motorization. The results of the war in developing and utilizing motor transport, and the numerous difficulties encountered in the matter of horses, are too well known to require discussion here.

It is felt that there has in the past been an unwarranted conservatism in displacing the horse by the motor, and too much skepticism in regard to the practicability of the motor.

Motor development has progressed sufficiently to make it clear that we should cease to yield inch by inch, begrudingly and unwillingly, to motorization. We should definitely decide to motorize our army completely, except the cavalry and possibly machine guns and similar items. All transport and all artillery should be motorized. The rear drive truck of various sizes, the four-wheel drive, and the caterpillar principle afford a range of proven systems sufficient to meet all conditions. It is a question of perfecting types to suit the various needs.

With motorized light regiments and ammunition supply, the division will be considerably more mobile than is now possible.

12. Caterpillar carriage. This type seems promising, particularly for the large calibers, on account of the ease of going into battery and moving while in position or on the road. The extent to which it should be applied to smaller calibers is best determined by test.

The mounting of the power plant on the gun carriage, if contemplated, is not favored. It entails an unnecessary exposure of the means of transport. The gun may be rendered unserviceable through the failure of its transport, when the firing elements are in perfedt order.

In other words, a towed caterpillar vehicle seems more promising, except in carriages so large that power on the carriage is needed for mechanical maneuvers.

One corps commander favores a caterpillar, self-propelled light howitzer for an accompanying gun. It is thought however that with a motorized light artillery this would be unjustified.

13. Ammunition vehicle. The caisson has distinctly proven unsatisfactory for the 155 howitzer and to a lesser extent for the 75. It is designed too much for use in the firing battery, and not enough as an efficient means of transport. Ammunition should be shipped, transported and served to the guns either in bulk or in boxes of convenient size. The caisson should not be emplaced with the firing battery in action. Protection for the cannoneers is obtained by digging in. The ammunition vehicle then becomes simply a means of transport, and it should be a type suitable for general use under corresponding conditions.

Similarly the ammunition truck of special type should be eliminated.

A certain proportion of ammunition, as well as other, transport should be of the caterpillar type, in order to make it mobile off roads.

14. Ammunition. The array of projectiles, fuses, and charges with which our artillery is equipped today is a monstrosity. Its justification lies in the constant developments which have taken place. Ammunition should be standardized in all respects as soon as possible and reduced to a few distinct types.

It is interesting to note that all agitation for the unit projectile has disappeared, even with the Germans. The French never favored it.

With the armament previously recommended herein, there would be the following calibers:

75
155
8", or thereabouts

A large caliber for the howitzers of the Army artillery (par.10) This permits a relatively simple system of ammunition.

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Shrapnel should be eliminated for all except the 75 for which it is by all means desirable. Howitzer shrapnel fire is not efficient, nor is long range shrapnel fire.

There is no longer doubt as to the efficiency of the large capacity shell.

The stream line projectiles should be perfected and adopted, with the elimination of the less efficient forms.

15. Trench mortars. They have not justified themselves in this war and would be less effective in a more open war. They should not be included in any project (except possibly the infantry weapon). The present types may be preserved for use in the remote case where a necessity for them might develop.

16. The foregoing discussion has followed a somewhat different order than the points enumerated in the memorandum dated Jan. 3, 1919. These points are covered by paragraphs numbered as follows:

Board's item.	Paragraph herein.
c	
a	
b	4 to 8
d	2,8,11
d	9
e	9
f	9
g	10
h	10
i	12
j	14
	11

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January 25, 1919.

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